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| 10/577,314 | 04/28/2006 | Hiromitsu Nanba | 33082M312 | 4956 |
| 441 7590 11/06/2009 SMITH, GAMBRELL & RUSSELL 1130 CONNECTICUT AVENUE, N.W., SUITE 1130 WASHINGTON, DC 20036 | | | EXAMINER GOLIGHTLY, ERIC WAYNE | |
| | | | ART UNIT 1792 | PAPER NUMBER |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/577,314

Applicant(s)

NANBA ET AL.

Examiner

Eric Golightly

Art Unit

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 July 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 11-33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-856)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date 28 April 2006 and 08 June 2007

DETAILED ACTION

Election/Restrictions

1. Applicants' election without traverse of Group I (claims 1-10) in the reply filed on 7/17/2009 is acknowledged. Claims 11-33 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention.

The term "rapidly" in claim 4 (line 2) is a relative term which renders the claim indefinite. The term "rapidly" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicants are advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0130106 to Mertens et al. (hereinafter "Mertens").

Regarding claim 1, Mertens teaches a substrate cleaning method (abstract) and discloses: performing a rinse process on a substrate to be processed with water (paragraph [0040]) supplied to a surface thereof while rotating the substrate in a

substantially horizontal state (Fig. 1, ref. 2 and paragraph [0040]); and thereafter performing a spin dry process on the substrate (paragraph [0018]) while forming a liquid film in a substantially outer region of a water fed point to the substrate (paragraph [0018]) and moving the water feed point to the substrate outward from a center of the substrate (Fig. 1, ref. 3 and paragraph [0056]).

Mertens does not explicitly teach: that the water is pure water and making a feed amount of water to the substrate smaller than that at a time of the rinse process. It would have been obvious to one of ordinary skill in the art at the time of the invention to use water that is pure in the method as per the Mertens teaching since the use of pure water is known in the art for effective cleaning. Further, the skilled artisan would have found it obvious to try making a feed amount of water to the substrate smaller than that at a time of the rinse process in order to increase the speed of the drying process (paragraph [0018]) since there are only three possibilities: make the feed amount smaller, keep it the same, and make the feed amount larger.

Regarding claim 2, Mertens does not explicitly teach speeds at which the water feed point is moved. However, it can be reasonably expected that a point before the water feed point begins to move outward from a center of the substrate, it is not moving relative to the substrate (see, e.g., paragraph [0050]), i.e., its speed is zero. Thus, a speed of moving the water feed point to the substrate outward from the center of the substrate is made faster at an outer peripheral portion of the substrate than at the center portion thereof (faster than zero).

Regarding claims 3 and 4, Mertens discloses spraying nitrogen gas to the center portion of the substrate (Fig. 1, ref. 4 and 5 and paragraphs [0055] and [0056]) and moving the water feed point at a speed of 3 mm/sec (paragraph [0055]), but does not explicitly teach: stopping movement of the water feed point when it is separated from the center of the substrate by a predetermined distance, stopping the nitrogen and moving the water feed point again. Since the application of insufficient nitrogen may result in insufficient drying but the application of excess nitrogen may result in waste, the supply or stoppage on nitrogen is a result-effective variable and the skilled artisan would have found it obvious to optimize the supply or stoppage of the nitrogen through routine experimentation, including when the water feed point is 10 to 15 mm separated from the center of the substrate depending, e.g., on the size of the substrate. It is noted that the present claim language does not require that the water feed point be feeding water throughout its movement, i.e., the feed point (such as a nozzle) may be moving but without water flow. Further, the claims do not require that the second movement of the feed point necessarily follows the stoppage of the nitrogen, i.e., the nitrogen may be stopped after the feed point begins moving again.

Regarding claim 5, Mertens discloses the method wherein, after the water feed to the substrate is shifted from the center of the substrate, a nitrogen gas is sprayed to the center to the portion of the substrate (Fig. 1 ref, 2, 3, 4 and 5 and paragraphs [0017], [0050] and [0055]), after which a spray point of the nitrogen is moved, together with the water feed point, outward from the center portion of the substrate while spraying nitrogen gas on the substrate (paragraph [0056]). It is noted that the claim does not

require that there be no nitrogen gas spray before the water feed point is shifted from the center of the substrate.

Regarding claim 6, Mertens does not explicitly teach stopping the spraying of the nitrogen while moving the spray point of the nitrogen. Since the application of insufficient nitrogen may result in insufficient drying but the application of excess nitrogen may result in waste, the supply or stoppage on nitrogen is a result-effective variable and the skilled artisan would have found it obvious to optimize the supply or stoppage of the nitrogen through routine experimentation.

Regarding claim 7, Mertens discloses the method wherein a number of rotations of the substrate ranges is at least 100 rpm and less than 2500 rpm (paragraph [0056]), but does not explicitly teach that the rinse process is between 100 and 1000 rpm and the spin drying process is between 800 and 2500 rpm. Since an insufficient rotational speed may result in insufficient film distribution and insufficient drying, and an excess speed may result in energy waste, the rotational speed is a result-effective variable and the skilled artisan would have found it obvious to optimize the rotational speed through routine experimentation for the rinsing process and the spin drying process.

Regarding claim 8, Mertens does not explicitly teach the method wherein the number of rotations of the substrate at a time of the spin dry process is set greater than a number of rotations of the substrate at a time of the rinse process. The skilled artisan would have found it obvious to try using a number of rotations of the substrate at a time of the spin dry process which is set greater than a number of rotations of the substrate at a time of the rinse process with a reasonable expectation of success in order to

effectively dry the substrate (paragraph [0056]) since there are only three possibilities, i.e., spin dry rotations = rinsing rotations, spin dry rotations > rinsing rotations and spin dry rotations < rinsing rotations. It is noted that Mertens discloses a rinsing rotation speed (paragraph [0039] which is lower than a disclosed spin drying speed (paragraph [0054]).

Regarding claim 9, Mertens discloses the method wherein a number of rotations of the substrate ranges is at least 100 rpm and less than 2500 rpm (paragraph [0056]), but does not explicitly teach that the rinse process is between 100 and 1000 rpm and the spin drying process is between 1500 and 2500 rpm. Since an insufficient rotational speed may result in insufficient film distribution and insufficient drying, and an excess speed may result in energy waste, the rotational speed is a result-effective variable and the skilled artisan would have found it obvious to optimize the rotational speed through routine experimentation for the rinsing process and the spin drying process.

Regarding claim 10, Mertens discloses the method wherein both hydrophobic and hydrophilic substrate surfaces are treated (paragraph [0061]), but does not explicitly teach a mixture of a hydrophobic and hydrophilic surfaces on a single substrate. The skilled artisan would have found it obvious to perform the Mertens method wherein a mixture of a hydrophobic surface and a hydrophilic surface exists on the surface of the substrate with a reasonable expectation of success since Mertens discloses both hydrophobic and hydrophilic substrate surfaces may be treated (paragraph [0061]). It is noted that Mertens discloses that a conventional method left undesirable residues on surfaces having mixed hydrophilic and hydrophobic surfaces (paragraph [0006]). It is

further noted that the present application does not disclose the criticality of a mixture of a hydrophobic surface and a hydrophilic surface (see, e.g., the present specification at, inter alia, page 7, paragraph [0013]).

Double Patenting

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

9. Claims 1-10 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 13, 14 and 17 of copending Application No. 11/976,188 to Nanba et al. (published as US 2008/0173333 and hereinafter "App. '188"), which teaches a substrate cleaning method, in view of Mertens (US 2002/0130106).

The claims of App. '188 differ from those of the present application in that the claims of App. '188 do not explicitly teach: that the water is pure water and moving the water feed point outward from a center of the substrate. It would be obvious use water that is pure in the method as taught in the claims of App. '188 since the use of pure water is known in the art for effective cleaning. It is noted that the use of pure water is disclosed in the specification of App. '188 (see US 2008/0173333 at, inter alia, paragraph [0042]).

Mertens teaches a substrate cleaning method (abstract) and discloses: moving the water feed point to the substrate outward from a center of the substrate (Fig. 1, ref. 3 and paragraph [0056]), which is disclosed as advantageously enhancing the removal of liquid from the substrate surface. It would be obvious to include the step of moving the water feed point outward from a center of the substrate as per the method of the Mertens teaching in the method as taught by the claims of App. '188 in order to enhance the removal of liquid from the substrate surface.

This is a provisional obviousness-type double patenting rejection.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric Golightly whose telephone number is (571) 270-3715. The examiner can normally be reached on Monday to Thursday, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Kornakov can be reached on (571) 272-1303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

EWG
/Michael Kornakov/
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